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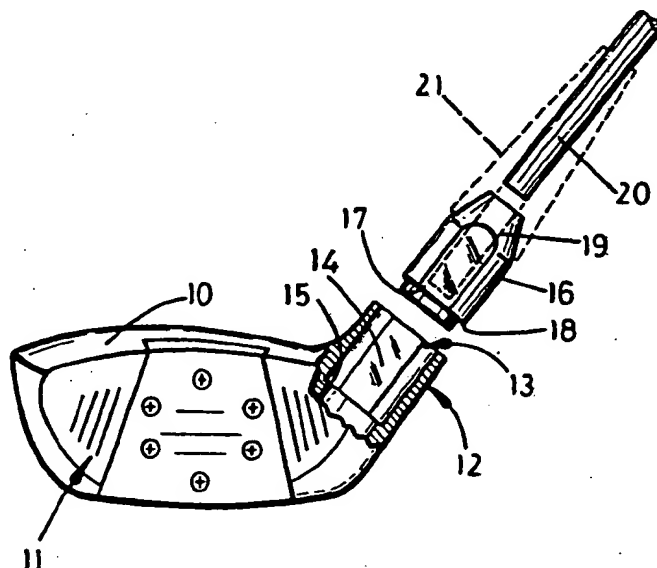
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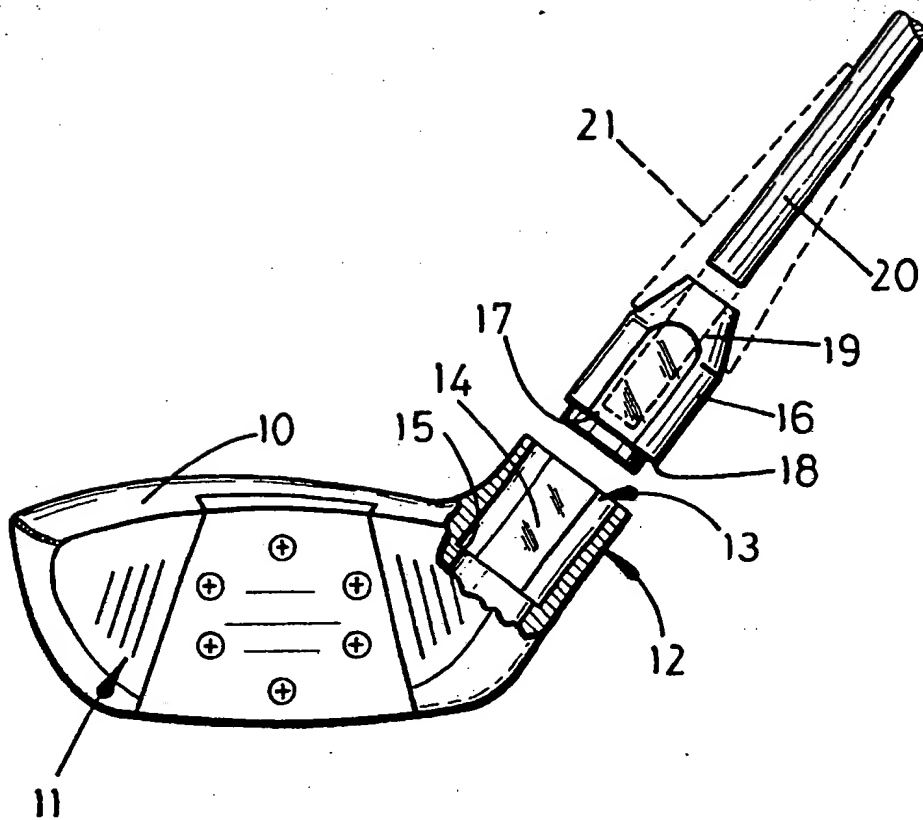
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## (54) Golf clubs

(57) A golf club comprises an insert 16 for location in a bore 13 in the club head 10, the insert 16 having a second bore 19 for receiving one end of a shaft 20. The orientation of the second bore 19 determines the angle between the shaft 20 and a striking face of the head 10 so that different inserts 16 used with a standard head 10 produce clubs having different characteristics. A ferrule 21 may cover the point at which the shaft 20 enters the second bore 19.



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MEANS FOR CHANGING THE LIE AND  
THE FACE ANGLE OF A GOLF CLUB

This invention relates to golf clubs.

Golf clubs are manufactured with a head and a shaft, these components being connected to each other through the neck (hosel) portion of the said head. It is  
5 normal practice to manufacture the head and the neck portion as an integral unit. A bore is then formed in the neck portion to receive the golf club shaft which is secured therein. If the golf club is a "wood", i.e. it has a club head having a bulbous head made of wood, metal  
10 or synthetic material, the shaft and the integral head and neck can be decoratively enhanced by the provision of a ferrule.

It frequently happens that players of the game of golf require golf clubs of different specifications  
15 particularly as regards the lie and face angle of the club head relative to the shaft. The lie of the club head can be varied in accordance with a number of factors. For example, the angle between the shaft and the base of the club head, for a given club, can be  
20 varied to accommodate the height of the person using the club. A standard angle for a No. 1 wood, i.e. a Driver, may be an angle of 55° between the shaft and the base or sole of the club head. A No. 3 wood and a No. 5 wood (i.e. woods having a striking face inclined  
25 at a greater angle of loft than that of the Driver) may have a lie angle of say 56° and 57° respectively. In

addition to variation of the lie angle, a player may require that the angle of the club face be varied in relation to the shaft in order to meet his personal idiosyncrasies. For example, the toe or outer free  
5 end of the club head can be turned about the golf shaft to a hooked or inturned position or, alternatively, the toe of the head can be rotated in the opposite direction about the shaft so that the club face assumes a sliced or outwardly turned disposition.

10 In order to accommodate the various positional requirements described above, it will be appreciated that the bore in the integral head and neck of the club head will require to be angled appropriately to receive the shaft therein. Each integral head and neck requires to  
15 be specially manufactured and if there is any error in manufacture with regard to the angle of the shaft receiving bore, then the combined head and neck may well have to be discarded.

An object of this invention is to provide a method  
20 of connecting a golf club head to a shaft which facilitates ready variation in the specifications of the club head particularly as regards the alignment of the shaft relative to the club head.

According to this invention there is provided a  
25 method of securing a golf club head to a shaft comprising forming a first bore in the club head for receiving an insert therein; forming a second bore in the insert for

receiving a golf club shaft, the disposition of said second bore determining the angular relationship between the shaft and a face of the club head; and locating the insert within said first bore in the golf club head.

5       According to a further aspect of the present invention, there is provided a golf club comprising a head portion having a first bore therein; and an insert adapted to be received with said first bore, said insert having a second bore therein for receiving a golf club shaft and the  
10 disposition of said second bore determining the angular relationship between the shaft and a face of the club head.

      According to yet another aspect of the present invention there is provided an insert for a golf club head and adapted to be located in a bore in the club head,  
15 said insert comprising a further bore for receiving a golf club shaft therein for determining the angular disposition of the shaft relative to a face of the club head, and means externally of the insert for fixedly positioning the insert within the bore of the club head.

20       An embodiment of the present invention will now be described with reference to the accompanying drawing which shows a wood-type golf club, said club having a head 10, provided with a face 11 by means of which the club can strike a golf ball. The head 10 is provided with  
25 an integral neck portion 12 having a first bore 13 formed therein. The bore 13 has a pair of opposed flat surfaces 14. The lower or inner end of the bore 13 is formed with

a shoulder 15 so that the inner portion of the bore is of reduced diameter.

The bore 13 is dimensioned to receive therein a one-piece insert 16, e.g. of an aluminium alloy or other material, also having a pair of opposed flat surfaces 17 formed on the outer surface thereof. The lower end of the insert 16 is provided with a shoulder 18 adapted to abut against the shoulder 15 of the bore 13 when the insert is inserted therein. The co-operating flat surfaces 14 and 17 of the bore 13 and insert 16 respectively prevent rotation of the insert 16 relative to the bore 13.

The insert 16 is provided with a further substantially central bore 19, varied in accordance with a number of factors and adapted to receive and have secured therein the lower end of a golf shaft 20. A ferrule 21 is located around the junction between the shaft 20 and the insert 16 to provide a finished appearance to the junction between these components.

In the assembly of the above-described golf club, an insert 16 is selected and drilled to provide a bore 19 having an angle which will satisfy the required specifications for the particular club in question prior to insertion of the insert 16 into the bore 13 of the club head 10. The insert 16 with its angled, predrilled bore 19 is then inserted into the bore 13 of a club head 10 and is secured therein. The shaft 20 is then inserted into the bore 19 of the insert 16 and secured therein and

surrounded, if desired, by the ferrule 21.

As a result of the present invention, club heads do not require to be made to a plurality of different specifications but can be made uniformly as a batch. The angular requirements of the shaft relative to the head can then be accommodated by drilling the bore 19 of the insert 16 at the predetermined required angle prior to its insertion in the head 10. If a player subsequently requires to vary the angle of the shaft in relation to the club head or club face, then the existing insert can be removed and a further insert drilled in accordance with the modified specifications required and inserted in the bore 13 of the club head.

The invention described above is particularly adapted for use with "wood-type" golf clubs made from metal. They can be of any other suitable material such as wooden woods, a synthetic plastics material such as acrylonitrile butadiene styrene, metal alloy, fibre glass, graphite, lauramite, ceramic, Nylon (RTM) or any combination of such materials. The method according to the invention of connecting the shaft to the club head can, however, also be used for any golf club including so-called "irons" and "putters" in which the heads are of a generally planar form rather than the bulbous wood-type heads.

CLAIMS

1. A method of securing a golf club head to a shaft comprising forming a first bore in the club head for receiving an insert therein; forming a second bore in the insert for receiving a golf club shaft, the disposition  
5 of said second bore determining the angular relationship between the shaft and a face of the club head; and locating the insert within said first bore in the golf club head.
2. A method as claimed in claim 1, comprising providing the external surface of the insert and the internal surface  
10 of the first bore in the golf club head with co-operating surfaces for preventing relative rotation between the insert and the club head.
3. A golf club comprising a head portion having a first bore therein; and an insert adapted to be received with  
15 said first bore, said insert having a second bore therein for receiving a golf club shaft and the disposition of said second bore determining the angular relationship between the shaft and a face of the club head.
4. A golf club as claimed in claim 3, in which the  
20 external surface of the insert and the internal surface of the first bore in the golf club head are provided with co-operating surfaces for preventing relative rotation between the insert and the club head.
5. A golf club as claimed in claim 3 or 4, in which a  
25 ferrule is secured around the junction between the shaft



and the insert.

6. An insert for a golf club head and adapted to be located in a bore in the club head, said insert comprising a further bore for receiving a golf club shaft for  
5 determining the angular disposition of the shaft relative to a face of the club head, and means externally of the insert for fixedly positioning the insert within the bore of the club head.

7. An insert as claimed in claim 6, in which the insert  
10 is cylindrical and the means for fixedly positioning the insert relative to the club head comprises at least one flat surface on the exterior of the insert for co-operation with a surface on the interior of the club head bore.

8. A method of securing a golf club head to a shaft  
15 substantially as hereinbefore described with reference to the accompanying drawing.

9. A golf club substantially as hereinbefore described with reference to the accompanying drawing.

10. An insert for a golf club head substantially as  
20 hereinbefore described with reference to the accompanying drawing.

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